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ABSTRACT

Two experiments involving 36 deaf college students investigated the amounts of information remembered by students from the different quarters of a lecture and the effect of printed vs. interpreted presentation of lecture material. In the first experiment, 20 deaf college students received an interpreted, videotaped presentation of one lecture and a printed presentation of a second lecture. In Experiment 2, sixteen deaf students received one interpreted presentation and, then, a second interpreted presentation on a different topic. In both experiments, students wrote down the information they remembered immediately after each presentation. Recall protocols were scored for the distribution of ideas recalled from each quarter of the lecture. The principal findings were that students recalled: more information from the first two quarters than from the second two; more information from a printed than an interpreted presentaton; and more information from a second interpreted presentation than from a previous interpreted one. Implications are drawn for providing educational support to mainstreamed deaf students. (Author/SB)

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Recall of Different Segments of an Interpreted Lecture by Deaf Students

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NTID's principle goal in doing research is to influence the education, training and career placement of deaf citizens through systematic examination of issues related to deafness. As one part of NTID's total research effort, the Department of Research and Development conducts descriptive and experimental research. Research findings are used in the development of programs and materials in the areas of learning and instruction, personal and social growth, and career develpment of deaf students. This document was developed in the course of an agreement with the U.S. Department of Health, Education and Welfare.

Educational Implications of a Study of Recall of Different Segments of an Interpreted Lecture by Deaf Students

In the first experiment in this study, deaf college students received an interpreted, videotaped presentation of one lecture and a printed presentation of a second lecture. In the second experiment, deaf students received one interpreted presentation and, then, a second interpreted presentation on a different topic. The educational implications of the results of these experiments are summarized below.

The major finding was that students remembered different amounts of information from the different quarters of the lecture. Recall was higher for the first two quarters than for the second two. One instructional strategy suggested by this finding is that the instructor place the most important information at the beginning of the lecture since the student is most likely to remember the material from that part. The finding that students recalled more information from the first two quarters of the lectures also points to the need, particularly in mainstreaming programs, to re-examine the lecture approach in the presence of deaf students. The use of "breaks" - to write on the board, pause, use some form of media, ask a question, generate a discussion-seems to be a desirable teaching strategy.

One interpretation of the decrease in recall for the second two quarters of the lecture is that it reflected the accumulation

of visual fatique that interfered with the processing of material. It is important for teachers and interpreters to understand the educational implications of visual acuity and visual fatique in deaf and hard-of-hearing students.

Mainstreamed education sometimes requires deaf students to learn from interpreted lectures. In some lecture situations, such as learning historical details, the deaf student may have difficulty acquiring the information. Consequently, it is important to find ways of insuring that students process information from interpreted lectures as efficiently as possible.

Abstract

In Experiment 1, 20 deaf college students received an interpreted, videotaped presentation of one lecture and a printed presentation of a second lecture. In Experiment 2, 16 deaf students received one interpreted presentation and, then, a second interpreted presentation on a different topic. In both experiments students wrote down the information they remembered immediately after each presentation. Recall protocols were scored for the distribution of ideas recalled from each quarter of the lecture. The principal findings were that students recalled: (a) more information from the first two quarters than from the second two; (b) more information from a printed than from an interpreted presentation; and (c) more information from a second interpreted presentation than from a previous interpreted one. The findings of the study are discussed in terms of their implications for providing educational support to mainstreamed deaf students.

Recall of Different Segments of an Interpreted Lecture by Deaf Students.

Educators of deaf persons have always been cautious in their use of the lecture format in teaching. Their intuitions in this regard have been based on observations regarding attention span, restlessness, and other non-verbal communication behaviors in their students. As a result, educators of deaf students have been characterized as more mobile and less directive than teachers of hearing students (Wolff, 1977). As more deaf students enter mainstream education, however, their learning in lecture-oriented classrooms must be examined. One critical factor is their recall of lecture material. In mainstream settings, interpreters are used extensively to help deaf students better follow classroom lectures. While an interpreter is helpful, there is evidence that even with an interpreter the deaf student does not comprehend and remember as much information as does his normally hearing peer (Jacobs, 1977). In order to deal with these difficulties, an important step would be to identify the processing strategies necessary for effective comprehension and retention of lecture information.

It is clear from research with normally hearing students that memory for lecture material is highly selective. For any given passage, some statements will be recalled by almost everyone while others will be forgotten (Glenn, 1978; Meyer and McConkie, 1971). In view of this tendency to be highly selective in remembering information, it is educationally important to identify the kinds of information that the student is most likely to retain. Often students will depend upon information from a lecture to understand

subsequent lectures and to prepare for exams. Research with normally hearing students indicates that retention depends in part upon location of the information in the beginning-to-end sequence of the lecture (Meyer and McConkie, 1973; Kintsch and Kozminsky, 1977). Kintsch and Kozminsky (1977) found that college students recalled more information from the first and last quarters of a story than from the middle two quarters. It seems reasonable to expect that location of information would also influence the retention of deaf students.

One can predict that deaf students would have particular difficulty comprehending and remembering the information in the first quarter of an interpreted lecture on the basis of the following reasoning: Students use expectations generated from the ideas in previous parts of the lecture to identify unintelligible words. They can identify these unintelligible words because they have specific ideas about the information that subsequent sentences will contain. The first quarter of the lecture, however, is not preceeded by contextual cues that can aid understanding, so it is difficult to understand and remember ideas in this part. On the other hand, students may be able to extract enough information from these initial sentences so that they can more completely comprehend the second, third and fourth quarters of the lecture.

An alternative prediction is that deaf students would remember more information from the first 2 quarters of lecture than from the latter two quarters, since comprehension and recall may depend in part upon the efficiency of the visual system. Visual fatigue may accumulate as the lecture progresses so that it interferes with the processing of material to a greater extent during the third and fourth quarters.

The purpose of Experiment 1 was to compare recall of ideas in terms of their distribution over the four quarters when the lecture was printed and when it was interpreted. The focus of the research was not to evaluate the relative ease in comprehension and retention of print and video material. (The issue of relative ease in comprehension has been investigated by Gates [1971] and Norwood [1976] and discussed by Stuckless [1978]).

Experiment 1

Method

Subjects. The subjects were 19 deaf volunteers 18 to 25 years of age who attended the National Technical Institute for the Deaf (NTID). Their average pure-tone threshold in the speech range for the better ear was 9[illegible] dB (range: 67-115 dB). Their mean grade-equivalent score on the California Reading Comprehension Test was 9.34 (range: 7.9-11.8), and their mean score on the NTID writing test was 8.67 (range: 6.89-10.00). (This test has a scale of 1 to 10, and the mean score for the group was at a level where most of the written message could be clearly understood [Crandall, Note 1].) In addition, their mean score on the NTID manual reception test was 73.8. (This test has a scale of 00-100, and the mean score for the group was at a level where the student understood most of the content of the message [Johnson, 1976].)

Materials. Two lectures were composed by one of the co-authors, an English instructor at NTID: "Modern Attitudes Toward Death", and "'Jaws' and Other Sea Monster Stories". Table 1 contains the introductory paragraph from the lecture "Modern Attitudes Toward Death".

Insert Table One about here

The two lectures were approximately equal in length (about 1200 words), vocabulary level, number of details, interest, and structural organization. The structural organization of the lectures was similar in the following respects: (a) The first paragraph was concerned with the contemporary relevance of the theme; (b) the second paragraph provided the main theme of the lecture; (c) each lecture contained a similar number of paragraphs dealing with selections of literature that elaborated upon the theme; (d) the distribution of topic sentences (at the beginning or end of paragraphs) was similar. An effort was made to equally distribute the relatively important material over the four quarters.

The printed and videotaped presentations of each lecture were identical, except for omission of some colloquialisms and conversational conventions in the printed versions. The printed versions were presented in a 4-page booklet. The video presentations were taped in color with a lecturer and an interpreter who was a member of the professional interpreting staff at NTID. The interpreter used lip movements, signs and fingerspelling. The signs and fingerspelling represented a transliteration of the spoken message, except for omission of a few inflections and function words. The format of the videotaped presentations consisted of an interpreter in the foreground and a lecturer in the upper right hand corner of the screen in a smaller frame. This arrangement optimized the representation of the interpreter while maintaining a smaller picture of the lecturer.

Procedure. The students were tested in groups of one to four. All students were administered one interpreted and one printed lecture, with topic ("Jaws" vs. "Death") and type of presentation (printed vs. videotaped) counterbalanced. The presentation times for the printed and interpreted lectures were approximately equal (9 and 10 minutes for the "Death" and "Jaws" lectures respectively). The videotapes were played back without sound. Upon completion of each lecture, students were instructed to (a) write down the important facts and ideas, (b) to guess if uncertain about what they remembered, and (c) not to include irrelevant material. The time limit for recall was 20 minutes.

Scoring of Recall Protocols. Scoring of the students' protocols for the distribution of ideas recalled from each quarter required four steps:

1. Each of the two printed versions was broken down into "idea units". An idea unit was defined as a clause or sentence containing an action or stative verb. Relationships between modifiers and their modified terms were not considered separate units unless they appeared as relative clauses (Thorndyke, 1977). Furthermore, relative clauses merely introducing a statement were not counted. For each of the lectures, segmentation points for idea units were determined and compared for two coders. The percentage of agreement between the two coders was .81 for "Death", and .91 for "Jaws".

2. Idea units were delineated in each of the student's written protocols according to the same procedure used for the printed lectures. Inter-coder reliability for the number of units in a recall was .95.

3. The student's recall protocols were scored for the number of idea units that matched those in each of the four quarters of the original lecture. An idea unit in the student's protocol was scored as having matched an idea unit in the original lecture if both contained the same main concepts irrespective of wording. For example, one student wrote in his recall protocol, "Before World War II most people never talked about a topic death." This statement was scored as matching the following idea unit in the original lecture: "Before World War II, people refused to talk about death."

4. For each student, the number of matching units recalled in each of the four quarters of the lecture was tallied. There was an equal number of idea units in each quarter of the original lecture. Intercoder reliability (r) for the number of units in a quarter recalled by a student ranged from .89 to .96.

Results

Proportions were computed in order to analyze the data pertaining to recall of ideas from each of the four quarters. Each of the four proportions was computed by dividing the number of idea units recalled in a quarter by the total number of units written in the protocol. Table 2 shows the mean proportion of idea units recalled in each quarter for the interpreted and printed lectures.

Insert Table 2 about here

An analysis of variance of these data yielded the following results: (a) The proportions of idea units recalled from each quarter were significantly different from each other, $F(3,54) = 13.22$, $p < .001$. The mean scores in Table 2 show that more units were recalled from the first two quarters than from the second two; furthermore, for both the printed and interpreted presentations, recall was highest in the second quarter and lowest in the fourth. (b) Students recalled more units in all quarters when the lecture was printed than when it was interpreted, $F(1,18) = 11.58$, $p < .005$. (c) The interaction effect was not statistically significant.

Experiment 2

The purposes of Experiment 2 were: (a) to observe again for interpreted, videotaped lectures the proportion of idea units recalled from each of four quarters; and (b) to compare recall of material in one interpreted lecture with that in a subsequent interpreted lecture on a different topic. Since Experiment 2 used only interpreted lectures, a replication of the recall pattern yielded by Experiment 1 would increase confidence in the conclusion that, for interpreted material, students recall more information from the first two quarters of a lecture.

Method

Subjects. There were 16 NTID students who participated in Experiment 2. The group was similar to that in Experiment 1 with respect to the following characteristics: (a) puretone threshold for the better ear in the speech range ($M = 89.9$ dB, range = 67-120 dB); (b) California Reading Comprehension scores (M grade equivalent = 9.19, range = 7.4-10.6); (c) NTID writing test scores ($M = 8.75$; range = 6.5-10.0; and (d) NTID manual reception test scores ($M = 67.2$, range = 30-96.)

The same videotaped, interpreted lectures that had been used in Experiment 1 were also used in Experiment 2. Students viewed one lecture and immediately thereafter wrote down the information they remembered. Subsequently, they viewed a second lecture and again performed the recall task. Eight of the subjects viewed "Jaws" as the first lecture and "Death" as the second, and the other eight viewed the lectures in reverse order. The instructions preceding the lectures and the recall tasks were identical to those used for the interpreted lectures in Experiment 1. Each student's protocol was scored for the number of idea units recalled in each of the four quarters as described in Experiment 1.

Results

The data were analyzed to determine the proportion of idea units recalled from each quarter and to compare recall for the first and second lecture. In these analyses proportions were again computed by dividing the number of units recalled from a quarter by the number of written units in the protocol. Table 3 shows the mean proportion of units recalled for each quarter for the first and second lectures.

Insert Table 3 about here

These data were entered into an analysis of variance. The proportions of idea units recalled from each quarter were again significantly different from each other, $F(3,45) = 3.24$, $p < .05$. The mean scores from Table 3 indicate

that, again, more units were recalled from the first two quarters than from the second two. In addition, students recalled more units overall from the second lecture than from the first, $F(1,15) = 5.69$, $p < .01$. The interaction effect was not statistically significant.

Discussion: Implications for Instruction

The results of the present study, and studies already cited, provide a basis for suggestions that may be useful to professionals who provide support to mainstreamed deaf students. These professionals include tutors, notetakers and teachers of the deaf. The teachers may be preparing deaf students to enter mainstreamed classrooms, or they may be helping regular classroom teachers who instruct mainstreamed students.

The major finding was that students remembered different amounts of information from the different quarters of the lecture. Recall was higher for the first two quarters than for the second two. This recall pattern was obtained in Experiment 1 in which interpreted and printed lectures were used and also in Experiment 2 in which only interpreted lectures were used. One instructional strategy suggested by this finding is that the instructor place the most important information at the beginning of the lecture since the student is most likely to remember the material from that part.

The finding that students recalled more information from the first two quarters of the lectures also points to the need, particularly in mainstreaming programs, to re-examine the lecture approach in the presence of deaf students. While the presented lectures were comparatively short (9 and 10 minutes),

they were continuous. This suggests that after 4 or 5 minutes, the use of "breaks" - to write on the board, pause, use some form of media, ask a question, generate a discussion -is a desirable teaching strategy. Educational specialists working with deaf students in mainstream situations can assist instructors in restructuring lecture material around such visual breaks. Such restructuring may also be appreciated by hearing students who are trying to process a large amount of new information auditorily.

One interpretation of the decrease in recall for the second 2 quarters of the lecture is that it reflected the accumulation of visual fatigue that interfered with processing of the material. Comprehension and recall of interpreted information may depend heavily on the efficiency of the visual system. It is important for teachers and interpreters to understand the educational implications of visual acuity and visual fatigue in deaf and hard-of-hearing students (Johnson, Caccamise, Rothblum, Howard and Hamilton, 1981; Caccamise, Meath-Lang and Johnson, Note 2).

This decrease in recall for the second two quarters is a different pattern than that generally found among normally hearing persons. Normally hearing persons tend to remember more information from the first and last quarters than from the middle two (Kintsch and Kozminsky, 1977; Meyer and McConkie, 1973). Future research might compare the recall of deaf students who receive an interpreted presentation with that of normally hearing students who receive an auditory presentation. The findings from the studies with normally hearing students suggest that they would not show the decreased recall of material from the last quarter that occurred among the deaf students in the present study.

Mainstreamed education sometimes requires deaf students to learn from interpreted lectures. In some lecture situations, such as learning historical details, the deaf student may have difficulty acquiring the information. The present study provided evidence of this difficulty: Students recalled more information from the printed than from the interpreted presentation. Because of this difficulty, it is important to find ways of insuring that students process information from interpreted lectures as efficiently as possible.

One approach to dealing with this difficulty would be to provide deliberate practice to improve skill in attending to and remembering the most important information (cf. Stinson and MacLeod, Note 3). In Experiment 2 students recalled more information overall from the second lecture than from the first. This result suggests that comprehension and retention were greater in the second lecture. The educational implication of this idea is that deliberate practice may be involved in learning from lecture material.

In considering the implications of the present study's findings for interpreted communication in mainstreamed classrooms, the reader should realize that the findings were obtained in particular, highly-controlled circumstances. Similar findings may or may not be obtained in other circumstances. For example, the present study used a videotaped presentation. It is not clear whether comprehension of a videotaped presentation is similar to comprehension of a live presentation (cf. Caccamise, Blasdell and Heath-Lang, 1978). The present study is viewed as an initial effort to identify processes involved in effective comprehension and retention of interpreted communication in mainstreamed classrooms. Additional research is planned to identify other factors that influence the comprehension and retention of interpreted communication and to develop procedures for improving these skills.

Reference Notes

1. Crandall, K. Written language scoring procedures. Working Paper, National Technical Institute for the Deaf, Rochester, New York, 1980.

2. Caccamise, F., Meath-Lang, B., & Johnson, D. Assessment and use of vision: Critical needs of hearing-impaired students. Working Paper, National Technical Institute for the Deaf, Rochester, New York, 1980.

3. Stinson, M., & MacLeod, J. Recall of thematically relevant material by deaf students as a function of interpreted versus printed presentation. Paper presented at the annual meeting of the American Educational Research Association, Boston, 1980.

References

Caccamise, F., Blasdell, R., & Meath-Lang, B. Hearing-impaired person's simultaneous reception under live and two visual-motion media conditions. American Annals of the Deaf, 1977, 122, 339-343.

Gates, R.R. The reception of verbal information by deaf students through television medium - a comparison of speechreading, manual communication, and reading. Proceedings of the 45th Meeting of the Convention of American Instructors of the Deaf, 1971, 513-522.

Jacobs, L. The efficiency of interpreting input for processing lecture information by deaf college students. Journal of Rehabilitation of the Deaf, 11, 1977.

Johnson, D. Communication characteristics of a young deaf adult population: Techniques for evaluting their communication skills. American Annals of the Deaf, 1976, 121, 409-424.

Johnson, D., Caccamise, F., Rothblum, A., Howard, M., & Hamilton, L. Identification and follow-up of visual impairments in hearing-impaired populations. American Annals of the Deaf, 1981, 126.

Kintsch, W., & Kozminsky, E. Summarizing stories after reading and listening. Journal of Educational Psychology, 1977, 69, 491-499.

Meyer, B., & McConkie, G. What is recalled after hearing a passage. Journal of Educational Psychology, 1973, 65, 109-117.

Norwood, M. Comparison of an interpreted and captioned newscast among deaf high school graduates and deaf college graduates. Unpublished doctoral dissertation, University of Maryland, 1976.

Stuckless, E.R. A review of research at NTID. Rochester, New York: National Technical Institute for the Deaf, Rochester Institute of Technology, August, 1978.

Thorndyke, P.W. Cognitive structures in comprehension and memory of narrative discourse. Cognitive Psychology, 1977, 9, 77-110.

Wolff, S. Cognition and communication patterns in classrooms for deaf students. American Annals of the Deaf, 1977, 122, 319-327.

Footnote

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Table 1

Example of Material Used in Interpreted and Printed Lectures: Introductory Paragraph from "Modern Attitudes Toward Death"

Recently, many people around NTID have been talking about a subject that was never discussed a few years ago. That subject is death. The idea of death is not very pretty, it is true. But people in the 1970's are becoming more and more open-minded about the topic. At NTID, many students are discussing the ideas related to death. There are many reasons for this interest. Some students have had parents or close friends die. Cancer and heart disease are big health problems in the United States, and we read about these problems in the newspaper every day.

Table 2

Mean Proportion of Idea Units Recalled

From Each Quarter

As a Function of Type of Presentation

Type of Lecture Presentation	Quarter			
	First	Second	Third	Fourth
Printed	.17	.20	.14	.05
Interpreted	.19	.16	.07	.06

Table 3

Mean Proportion of Idea Units

Recalled from Each Quarter

for the First and Second Lectures

Presentation Sequence of the Lecture	Quarter			
	First	Second	Third	Fourth
First	.09	.14	.07	.10
Second	.14	.17	.09	.13